

This Page Is Inserted by IFW Operations
and is not a part of the Official Record

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

IMAGES ARE BEST AVAILABLE COPY.

**As rescanning documents *will not* correct images,
please do not report the images to the
Image Problem Mailbox.**



Europäisches Patentamt
European Patent Office
Office européen des brevets

Publication number:

**0 114 332
A2**

EUROPEAN PATENT APPLICATION

(21) Application number: 831127 55.0

(51) Int. Cl.³: A 44 B 11/25

(22) Date of filing: 19.12.83

(30) Priority: 23.12.82 SE 8207395

(43) Date of publication of application:
01.08.84 Bulletin 84/31

(84) Designated Contracting States:
DE FR GB IT

(71) Applicant: AUTOLIV AB
P.O. Box 124
S-44700 Vargårda(SE)

(72) Inventor: Emanuelson, Björn
Näcktergalsgatan 7
S-447 00 Vargårda(SE)

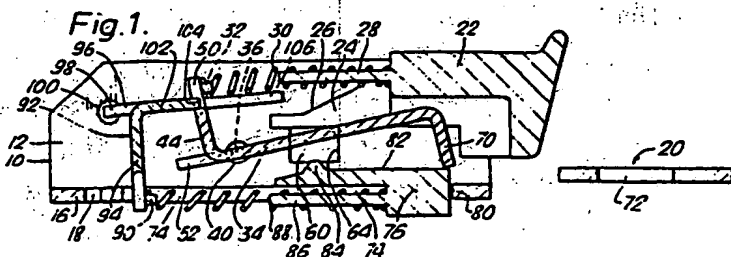
(72) Inventor: Wallin, Jan-Olof
Klockaregårdsvägen 3
S-441 35 Alingsås(SE)

(74) Representative: Frankland, Nigel H. et al,
FORRESTER & BOEHMERT Widenmayerstrasse 4/I
D-8000 München 22(DE)

(54) A buckle.

(57) A buckle adapted to engage and retain a tongue part attached to the strap portion of the vehicle safety belt when the tongue is inserted into the buckle along a predetermined path extending towards the rear of the buckle, said buckle comprising a main support member; a latch member mounted on said support member and movable between a "release" position and a "latching" position, the latch member having a portion adapted to engage an abutment face defined on said tongue when in said latching position; a secondary locking member dimensioned and located to be moved, when the latch member is in the latching position, to a position in which the secondary locking member engages

part of the latch member, thus preventing the latch member from being inadvertently moved to the release position; and actuator means, operable to move the secondary locking member to a position in which the latch member may move to the release position and for moving the latch to the release position to permit the tongue to be released from the buckle: the latch member having means adapted to engage the support member if and when a substantial force is applied to the tongue tending to withdraw the tongue from the buckle while the latch is in the latching position so that the force applied to the latch member by the tongue is transferred directly to the support member.



"A Buckle"

The present invention relates to a buckle, and more particularly relates to a buckle for use with a vehicle safety belt, such as a safety belt intended for use in a motor car.

5 Many different types of buckles have been proposed previously for use with a motor car safety belt. Virtually all the prior proposed buckles have been provided with a movable latch member contained within the buckle and movable from a retracted or "release" position in which a tongue member provided on the safety belt can be inserted into or withdrawn from
10 the buckle to a "latching" position in which part of the latching member engages an abutment present on the tongue to retain the tongue in position within the buckle. Certain prior proposed buckles have been provided with a secondary locking means designed to lock the latching member in its latching position so that the latching member cannot release the tongue
15 unintentionally, especially under the conditions of rapid deceleration that may be applied to a buckle during an accident.

It has been found that provision of a secondary locking means increases the reliability of the buckle, but also increases the complexity of a
20 buckle and thus also increases the manufacturing costs. Furthermore, in many of the prior buckles provided with a secondary locking means, the secondary locking means is so designed and located that when a force is applied to the tongue, in the direction of withdrawal of the tongue from the buckle, the force is transferred to the secondary locking means. In such a
25 case it may be difficult to open the buckle in an emergency. For example, if a vehicle overturns and an occupant of the vehicle is suspended by the safety belt, a considerable force will be applied to the tongue in the direction of withdrawal of the tongue from the buckle, and if this force is applied to the secondary locking means, the secondary locking means can

become compressed or jammed in position, thus preventing movement of the latching member to the "release" position. Thus, in such a situation, it may be impossible to release the tongue from the buckle.

5 U.S. Patent Specification No. 4,358,877 discloses buckles of the type discussed above, and in the embodiments shown in Figures 4 and 5 the latching member is defined by two parallel plates which are rotatable about the axis of a pivot pin. The plates are spring biased towards a latching position in which part of a tongue member is firmly trapped within a recess
10 formed on the underside of each of the plates. A secondary locking means, in the form of a bar, is resiliently biased into engagement with recesses in the plates such that rotation of the plates towards a release position is prevented. If a force is applied to the tongue the plates tend to rotate, thus transmitting a force directly to the bar. This tends to clamp the bar firmly
15 in position. Indeed, it is the bar that is the only means preventing rotation of the plate towards the release position. If a load is applied to the tongue, when the tongue is engaged in the buckle, in the direction of withdrawal of the tongue from the buckle, it may then prove to be totally impossible to actuate the buckle to release the tongue from the buckle.

20 According to this invention there is provided a buckle adapted to engage and retain a tongue part attached to the strap portion of the vehicle safety belt when the tongue is inserted into the buckle along a predetermined path extending towards the rear of the buckle, said buckle
25 comprising a main support member; a latch member mounted on said support member and movable between a "release" position and a "latching" position, the latch member having a portion adapted to engage an abutment face defined on said tongue when in said latching position; a secondary locking member dimensioned and located to be moved, when the latch member is in
30 the latching position, to a position in which the secondary locking member engages part of the latch member, thus preventing the latch member from being inadvertently moved to the release position; and actuator means operable to move the secondary locking member to a position in which the latch member may move to the release position and for moving the latch to
35 the release position to permit the tongue to be released from the buckle: the latch member having means adapted to engage the support member if and when a substantial force is applied to the tongue tending to withdrawn the

tongue from the buckle while the latch is in the latching position so that the force applied to the latch member by the tongue is transferred directly to the support member.

5 Advantageously the latch member is mounted for pivotal movement about a pivot axis and the said portion of the latch member adapted to engage an abutment face defined on said tongue is located forwardly of said pivot axis in the direction of insertion of the tongue into the buckle, and
10 wherein latch member defines a surface located to the rear of the axis of pivotal movement of the latch member having regard to the direction of insertion of the tongue into the buckle, said surface facing rearwardly away from said axis, the secondary locking member being dimensioned and located so that when the latch member is in the latching position the secondary
15 locking member can be moved to a locking position in which part of the secondary locking member is located immediately adjacent said surface on the latch element, thus preventing movement of the latch member towards the release position.

20 Preferably the main support member is in the form of a channel element having two upstanding side walls and an intermediate base portion, the latch member being mounted on the channel by means of pivot elements that extend through apertures formed in the side walls of the channel to permit said pivotal movement of the channel member.

25 Advantageously the predetermined path along which the tongue is inserted into the channel extends parallel with and adjacent to the base portion of the channel member, the said portion of the latch member extending substantially perpendicularly to the plane of the base portion of the channel member, when the latch element is in the latching position, and
30 extending into an aperture formed in the base of the channel member, the arrangement being such that when a force is applied to the latch member by the tongue, the said portion of the latch element is brought into engagement with the periphery of the aperture in the base of the channel member.

35 Conveniently said means to engage the support member additionally comprise laterally extending lugs on the latch member which extend into oversized apertures formed within the side walls of the channel, the

arrangement being such that when a force is applied to the tongue, tending to withdraw the tongue from the buckle while the latch is in the latching position, the lugs are brought into contact with the side edges of the apertures accommodating the lugs.

5

Preferably the latch member is mounted on said channel member with a play or degree of freedom of movement in the direction of said force tending to withdraw the tongue from the buckle.

10

Preferably said actuator means comprises a slidable manually operable element, said slidable element having means thereon defining a cam face, the secondary locking means having an extending portion adapted to engage the cam face, so that on actuation of the slidable element the extending portion engages the cam face and the secondary locking means is thus moved to a position in which the latch member may be moved to the release position.

15

In a preferred embodiment a compression spring extends between the slider element and a part of the latch member, said spring tending to bias the slider element forwardly, having regard to the direction of insertion of the tongue into the buckle, and tending to bias the latch member towards the release position.

20

The buckle may be provided with a spring biased ejector member, spring biased to eject the tongue from the buckle when the latch member is moved to the release position, said ejector member having means thereon adapted to engage a region of the latch member located to the rear of the pivotal axis of the latch member, having regard to the direction of insertion of the tongue into the buckle, so that when the tongue is inserted into the buckle rearward movement of the ejector causes the latch member to be moved to the latching position.

25

30

Conveniently the secondary locking member comprises a member having two substantially perpendicular arms mounted to execute a pivotal movement about a pivotal axis, a first of said arms extending substantially perpendicularly to the plane defined by the base of the channel, the spring biasing the said ejector being connected to the said first arm, the other

35

arm of the secondary locking member being substantially parallel with the plane of the base of the channel and defining said parts of the secondary locking member and being adapted to rest on upwardly directed faces formed on and upwardly extending portion of the latch member when the latch member is in a release position.

In order that the present invention may be more readily understood, and so that further features thereof may be appreciated, the invention will now be described, by way of example, with reference to the accompanying drawings in which:

Figure 1 is a diagrammatic transverse view of a buckle in accordance with the invention prior to the insertion of the tongue into the buckle with parts of the buckle being shown in section;

FIGURE 2 is a view corresponding to Figure 1 showing the tongue partially inserted into the buckle;

FIGURE 3 is a view corresponding to Figures 1 and 2 showing the tongue fully inserted in the buckle;

FIGURE 4 is a view corresponding to Figures 1 to 3 showing an intermediate stage during release of the tongue from the buckle, and

FIGURE 5 is a top plan view of part of the buckle shown in Figures 1 to 4.

The figures illustrate a buckle in a horizontal position with the open mouth of the buckle being shown towards the right hand side. The buckle will be described in this particular orientation, the right hand part of the buckle being considered to be the front of the buckle and the left hand part of the buckle being considered to be the rear of the buckle. The buckle will be described in this manner to facilitate a ready understanding of the buckle, but it is to be appreciated that buckles in accordance with the invention may be utilised in any desired orientation.

Referring now to the drawings a buckle for use with a seat belt, such

as a vehicle seat belt, comprises a channel shaped member 10 having two parallel upstanding side walls 12, 14 and a substantially flat horizontal base 16. An aperture 18 is formed in the flat base 16 of the channel to accommodate a bolt or rivet to enable the channel to be securely connected to a metal plate, length of wire or strap which is in turn connected to the body of a motor vehicle.

✓
10 The buckle will be provided with a cover made of plastics material, but the cover is not shown in the drawings for the sake of clarity of illustration.

15 A tongue element 20 connected to part of a safety strap may be inserted into the buckle following a path parallel with the plane of, and immediately adjacent to, the base 16 of the channel member 10. The tongue will be inserted into the buckle from the front (shown at the right hand side in the accompanying drawings) through an open mouth defined at one end of the channel.

20 An actuator or slider member 22 is provided which is mounted to effect a sliding movement axially of the channel 10, the slider member being located above the mouth of the channel at the front end of the channel. The slider member 22 has, on each side thereof, a rearwardly extending wing 24 which has a sloping upper surface 26 defining a cam surface. The slider member has a central rearwardly extending spigot 28. A
25 helical compression spring 30 is provided which has one end mounted about the spigot 28, the compression spring extending rearwardly. The other end of the compression spring engages a spigot 32 formed on part of a latch member 34.

30 The latch member 34 is a substantially planar member which is mounted between the upstanding side walls 12, 14 of the channel member 10. The latch member 34 has co-aligned opposed protruding pivot elements 36, 38 that extend into apertures 40, 42 formed in the upstanding side walls 12, 14, respectively, of the channel member 10. The latch member 34 can
35 thus pivot about a pivot axis defined by the pivot elements 36, 38. The apertures 40, 42 are slightly larger than the pivot elements 36, 38 so that there is a certain "play" between the latch member 34, 36, 38 and the

channel 10. To the rear of the pivot axis a central portion 44 of the pivot member 34 is cranked upwardly, the central region 46 of the cranked portion 44 extends upwardly for a greater distance than two-side regions 48, 50 of the cranked portion 44. The side regions 48, 50 thus define shoulders, the purpose of which will be explained hereinafter. The spigot 32, which is engaged by the compression spring 30, is provided adjacent the top of the central region 46 of the upwardly cranked portion 44.

On either side of the upwardly cranked portion 44 are rearwardly extending arms 52, 54 which are coplanar with the main portion of the latch member 34.

The parts of the latch member 34 that have thus far been described are all located to the rear of the pivot axis defined by the pivot element 36, 38. Moving now to the region in front of the pivot axis, the planar part of the latching member 34 has two co-aligned opposed lugs 56, 58 which are located forwardly of the pivot axis and which project sideways into corresponding oversized apertures 60, 62 formed in the sidewalls 12, 14, respectively, of the channel member 10. The oversized apertures are large enough to accommodate the above-mentioned "play" between the latch member 34 and the channel 10. The front vertical edges 64, 66, respectively, of the apertures 60, 62 form abutment surfaces as will be described hereinafter. A relatively narrow central region 68 of the latching member 34 extends forwardly of the lugs 56, 58 and terminates with a downwardly cranked portion 70. The downwardly cranked portion 70 is dimensioned to pass through an aperture 72 formed in the free end of the tongue 20, when the tongue has been inserted into the buckle as will be described hereinafter in greater detail. The downwardly cranked portion 70 is located forwardly of the pivot axis of the latch member 34 by a distance that considerably exceeds the distance between the pivot axis and the upwardly cranked portion 44.

An elongate aperture 74 is formed in the base 16 of the channel member 10. A tongue ejector element 76 is slidably mounted within the elongate aperture 74 to execute a sliding movement axially of the channel member 10. In the condition of the buckle illustrated in Figure 1 a forward face 78 of the ejector 76 is substantially abutting the front wall 80 of the

aperture 74.

5 The ejector member 76 has a substantially flat upper surface 82 which is provided, adjacent its rear edge, with an upstanding truncated pyramidal projection 84. The underpart of the ejector 76 is provided with a rearwardly extending spigot 86 which is surrounded by a compression spring 88 which extends axially of the channel member. The other end of the compression spring 88 engages a spigot 90 formed on a secondary locking member 92.

10 The secondary locking member 92 comprises a substantially planar member which is substantially horizontal. The central portion at the rear of the planar member is cranked downwardly to form a substantially vertical portion 94, and the spigot 90 is carried at the lower end of the vertical portion 94. Extending rearwardly, on either side of the downwardly extending portion 94, are two arms only one of which, 96, is shown. The arms carry pivot elements 98 which extend laterally through apertures 100 formed in side walls of the channel member, and thus the secondary locking member is mounted for pivotal movement about the pivot elements 98. The apertures 100 are slightly larger than the pivot elements to allow for a degree of "play" between the secondary locking member 92 and the channel member 10.

25 The main region 102 of the secondary locking member 92 has a central recess dimensioned to accommodate the central region 46 of the upwardly cranked portion 44 of the latch member 34. The adjacent parts of the main region 102 extend forwardly by such a distance that their forward most edges 104 just rest on the shoulders formed by the side regions 48, 50 of the upwardly cranked portion 44 when the buckle is in the condition illustrated in Figure 1. The said forwardmost edges 104 form abutment faces for a purpose that will be described in greater detail hereinafter. The side regions of the main part 102 of the secondary locking member 92 extend forwardly, to form operating arms 106 that are aligned with and can cooperate with the wings 24 provided on the slider member 22 which define the cam surfaces 26.

Figure 1 illustrates the buckle in the condition that it occupies before

the tongue 20 has been inserted into the buckle. It will be observed that the lower end of the downwardly cranked portion 70 of the latch member 34 is resting on the top surface 82 of the ejector member 76. Also, the forwardmost edges 104 of the main region 102 of the second locking member 92 rest on the shoulders defined by the side regions 48, 50 of the outwardly cranked portion 44 of the latch member. The compression spring 30 is in an almost fully extended condition. The compression spring 88 is also in a fully extended condition and the ejector element is located in a forwardmost position.

Figure 2 illustrates the situation that exists when the tongue 20 is being inserted into the buckle. It can be seen that the front edge of the tongue 20 has engaged the forward face 78 of the ejector 76, and the ejector 76 has been moved rearwardly. The compression spring 88 is thus being compressed. A force is thus being applied to the lower part of the downwardly extending portion 94 of the secondary locking member 92, tending to cause the secondary locking member 92 to rotate in a clockwise direction about the pivot axis defined by the pivot elements 98. However, since the forwardmost edges 104 of the main region 102 of the secondary locking member 92 are resting on the shoulders formed by the side regions 48, 50 of the upwardly cranked portion 44 of the latch member 34, the secondary locking member cannot pivot in the clockwise direction. In the condition illustrated in Figure 2 the upstanding projection 84 formed on the top of the slider is just engaging the rearwardly extending arms 52, 54 present on the latch member 34 at a point behind the pivot axis of the latch member 34 as defined by the pivot elements 36, 38. It is to be noted that the aperture 72 present in the tongue 20 is located immediately beneath the lowermost end of the downwardly cranked portion 70 of the latch element 34. As the tongue is pushed further into the buckle the ejector 76 moves further towards the rear of the buckle and the upstanding projection 84 firmly engages the rearwardly extending arms 52, 54 causing the latch member 34 to pivot in a clockwise direction about the pivot axis defined by the pivot elements 36, 38. This pivoting movement of the latch member 34 causes the downwardly cranked portion 70 to pass through the aperture 72 in the tongue 20, and also to pass through the forwardmost end of the aperture 74 formed in the base 16 of the channel member 10. This is the latching position of the latch member 34. As the latch member moves to the

latching position, the spigot 32 located at the top of the upwardly cranked portion 44 moves forwardly thus slightly compressing the compression spring 30. Thus it will be understood that the latch element 34 is only moved to the latching position against the bias of the compression spring 30.

5

As the latching element moves to the latching position so the upwardly extending cranked portion 44 moves forwardly, and the arrangement is such that when the cranked portion has effected this forward movement the forwardmost edges 104 of the main region 102 of the secondary locking member 92 no longer rest on the shoulders formed by the side regions 48, 50 of the upwardly cranked portion 44. The secondary locking member is thus able to execute a rotational movement in a clockwise direction about the axis defined by the pivot elements 98 under the bias of the compression spring 88. The rotational movement is executed rapidly with a "snap" action. Thus the lowermost end of the vertical portion 94, which carries the spigot 90 moves rearwardly when effecting this movement. When this movement has been effected, the operating arms 106 formed on the secondary locking member 92 are aligned with the cam faces 26 formed on the rearwardly extending wing elements 24 present on the slider member 22.

10

15

20

It will be appreciated, therefore, that as the tongue 20 is inserted into the buckle the ejector 76 is moved rearwardly, and the projection 84 on the ejector 76 cooperates with the latch member 34, causing the latch member 34 to rotate about its pivotal axis defined by the pivot elements 36, 38 and against the bias of the compression spring 30. As the latch member moves to the latching position the secondary locking element moves under the bias of the spring 88 and snaps into a locking position.

25

30

35

When the buckle is in the condition illustrated in Figure 3, that is to say in the latching condition, it is to be noted that the forwardmost edges 104 of the main region 102 of the secondary locking member 92 engage a rearwardly facing surface of the latch member 34 at a position to the rear of the pivot axis of the latch member 34. If the latch member 34 tends to move to the released position, for any reason, the rear face of the upwardly cranked portion 44 of the latch member 34 will engage the secondary locking member 92, thus preventing further movement of the latch member

✓

34 in that direction. Thus the latch member 34 is retained in the latching condition.

5 If a force is applied to the tongue 20 tending to withdraw the tongue
20 from the buckle, the latch member 34 will tend to move forwards very
slightly within the buckle, since the latch member is located in the buckle
with a certain play or tolerance. As the latch member moves forwardly the
lowermost part of the downwardly cranked portion 70 will engage the front
10 wall 80 of the aperture 74 formed in the base 16 of the channel. Also the
lugs 56, 58 will be drawn into contact with the abutment surfaces defined by
the front vertical edges 64, 66 of the apertures 60, 62 in the side walls 12,
14 of the channel 10. Thus, any force applied to the latch member 34 is
transferred to the channel at the above-mentioned points, and no force is
15 applied to the secondary locking member 92. Consequently, in an
emergency situation, the secondary locking member will not tend to jam in
the locking position.

When the tongue 20 is to be removed from the buckle the slider 22 is
20 pushed inwardly, that is to say is pushed towards the left as shown in the
drawings. On movement of the slider in this direction the spring 30 is
placed under compression and thus the spring exerts a force on the latch
member 34 which tends to rotate the latch member in an anti-clockwise
direction about the pivot axis defined by the pivot elements 36, 38.
25 However, during the initial stages of movement of the slider the latch
element is not free to rotate in this direction since the rear wall of the
cranked portion 44 still abuts the forwardmost edges 104 of the main part
102 of the secondary locking member 92. However, as can be seen from
Figure 4, as the slider 22 continues its leftward movement the sloping upper
30 surfaces 26 of the rearwardly extending wings 24 pass under and engage the
forwardly extending arms 106 formed on the secondary locking member 92,
and cause the secondary locking member 92 to pivot in an anticlockwise
direction about the pivot axis defined by the pivot elements 98, against the
biasing force provided by the compression spring 88. When the secondary
locking member 92 has moved pivotally by a certain distance the
35 forwardmost edges 104 of the main region 102 of the secondary locking
member 92 are no longer adjacent the rear wall of the latch member 34, but
instead are located above the level of the shoulders defined by the side

regions 48, 50 of the upwardly cranked portion 44 of the latch member 34. When this condition is reached the latch member 34 moves to the retracted or released position under the influence of the force applied to the latch member 34 by the compression spring 30, with the downwardly cranked portion 70 thus being withdrawn from the aperture 74 formed in the base 16 of the channel and also being withdrawn from the aperture 72 formed in the tongue 20. Thus the latch member 34 returns to the position illustrated in Figure 1. The slider then moves forwardly under the biasing effect of the spring 88, thus ejecting the tongue 20 from the buckle. When the slider is released the buckle returns to the initial condition as illustrated in Figure 1.

It is to be understood that if, for any reason, the force applied to the latch member 34 by the spring 30 on actuation of the slider is not sufficient to cause the latch member to move to the released position, when the slider 22 has been moved by a predetermined distance the rearwardly extending spigot 28 provided on the slider will contact the spigot 32 provided on the latch member 34, and further movement of the slider will then be directly transferred to the latch member 34.

Whilst only one embodiment of a buckle in accordance with the invention has been described and shown in detail, it is to be understood that many modifications and variations may be effected to the described buckle without departing from the scope of the present invention. For example, the upwardly cranked rear portion of the latch element need not necessarily form a right angle with the rest of the latch element, but may form any suitable angle with the plane defined by the main region of the latch element. The surface that is engaged by the secondary locking element need not necessarily be situated on a cranked portion of the latch member. The secondary locking member may have any desired shape or configuration, and instead of being pivotally mounted on the side walls of the channel, the secondary locking member may be movably attached to the bottom of the channel. It is, of course, to be understood that embodiments of the invention may be designed to accommodate a tongue part provided with one or more central openings, or to accommodate a tongue part having one or more recesses at the edges thereof for engagement with the latch member. Tongues of these two alternative configurations are well known in the art.

The features disclosed in the foregoing description, in the following claims and/or in the accompanying drawings may, both separately and in any combination thereof, be material for realising the invention in diverse forms thereof.

CLAIMS:

1. A buckle adapted to engage and retain a tongue part attached to the strap portion of the vehicle safety belt when the tongue is inserted into the buckle along a predetermined path extending towards the rear of the buckle, said buckle comprising a main support member; a latch member mounted on
5 said support member and movable between a "release" position and a "latching" position, the latch member having a portion adapted to engage an abutment face defined on said tongue when in said latching position; a secondary locking member dimensioned and located to be moved, when the latch member is in the latching position, to a position in which the
10 secondary locking member engages part of the latch member, thus preventing the latch member from being inadvertently moved to the release position; and actuator means operable to move the secondary locking member to a position in which the latch member may move to the release position and for moving the latch to the release position to permit the
15 tongue to be released from the buckle: the latch member having means adapted to engage the support member if and when a substantial force is applied to the tongue tending to withdraw the tongue from the buckle while the latch is in the latching position so that the force applied to the latch member by the tongue is transferred directly to the support member.

2. A buckle according to claim 1, wherein the latch member is mounted for pivotal movement about a pivot axis and the said portion of the latch member adapted to engage an abutment face defined on said tongue is located forwardly of said pivot axis in the direction of insertion of the
25 tongue into the buckle, and wherein latch member defines a surface located to the rear of the axis of pivotal movement of the latch member having regard to the direction of insertion of the tongue into the buckle, said surface facing rearwardly away from said axis, the secondary locking member being dimensioned and located so that when the latch member is in
30 the latching position the secondary locking member can be moved to a locking position in which part of the secondary locking member is located immediately adjacent said surface on the latch element, thus preventing movement of the latch member towards the release position.

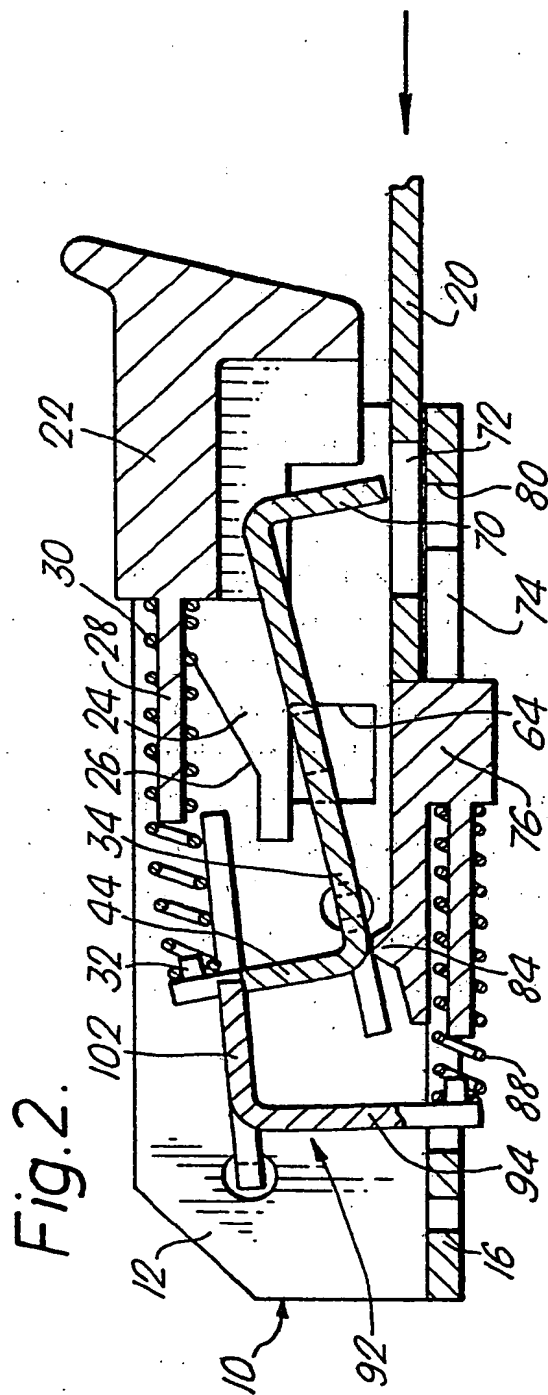
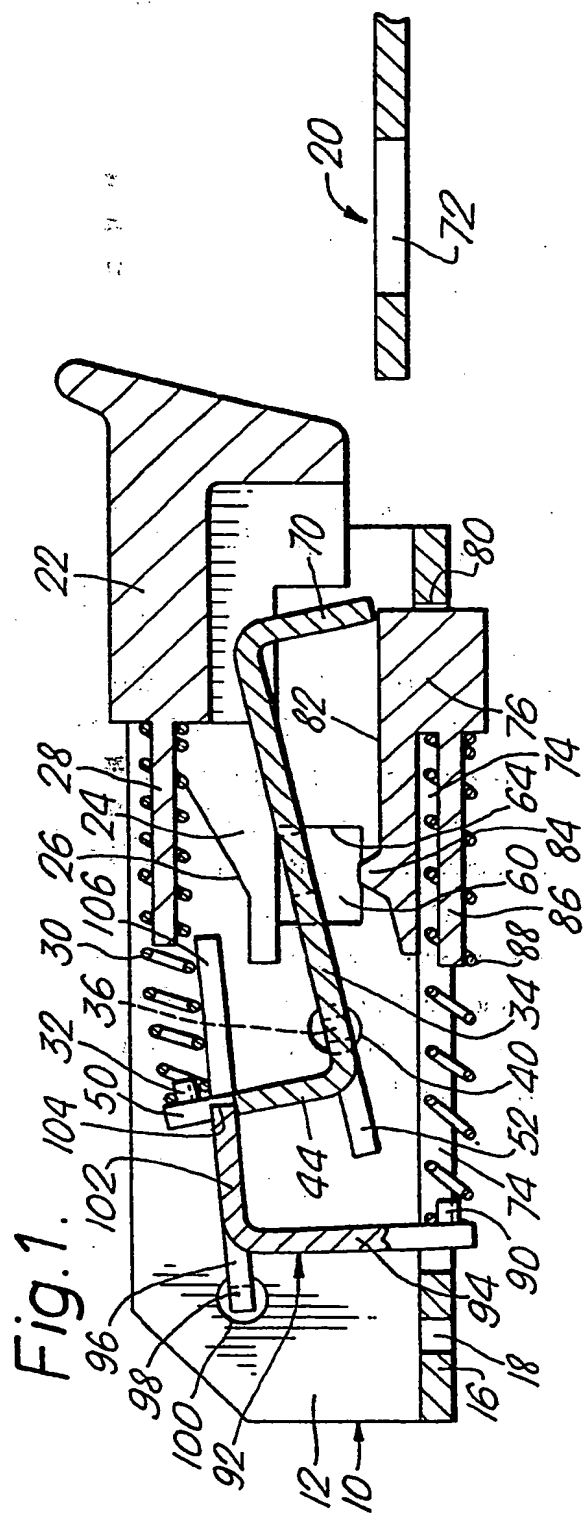
3. A buckle according to claim 2, wherein the main support member is in the form of a channel element having two upstanding side walls and an intermediate base portion, the latch member being mounted on the channel by means of pivot elements that extend through apertures formed in the side walls of the channel to permit said pivotal movement of the latch member.

4. A buckle according to claim 3, wherein the predetermined path along which the tongue is inserted into the channel extends parallel with and adjacent to the base portion of the channel member, the said portion of the latch member extending substantially perpendicularly to the plane of the base portion of the channel member, when the latch element is in the latching position, and extending into an aperture formed in the base of the channel member, the arrangement being such that when a force is applied to the latch member by the tongue, the said portion of the latch element is brought into engagement with the periphery of the aperture in the base of the channel member.

5. A buckle according to claim 3, or claim 4, wherein said means to engage the support member additionally comprise laterally extending lugs on the latch member which extend into oversized apertures formed within the side walls of the channel, the arrangement being such that when a force is applied to the tongue, tending to withdraw the tongue from the buckle while the latch is in the latching position, the lugs are brought into contact with the side edges of the apertures accommodating the lugs.

6. A buckle according to any one of claims 3 to 5, wherein the latch member is mounted on said channel member with a play or degree of freedom of movement in the direction of said force tending to withdraw the tongue from the buckle.

7. A buckle according to any one of the preceding claims, wherein said actuator means comprises a slidable manually operable element, said slidable element having means thereon defining a cam face, the secondary locking means having an extending portion adapted to engage the cam face, so that on actuation of the slidable element the extending portion engages the cam face and the secondary locking means is thus moved to a position in which the latch member may be moved to the release position.



8. A buckle according to claim 7, wherein a compression spring extends between the slider element and a part of the latch member, said spring tending to bias the slider element forwardly, having regard to the direction of insertion of the tongue into the buckle, and tending to bias the latch member towards the release position.

9. A buckle according to claim 2 or any claim dependent thereon provided with a spring biased ejector member, spring biased to eject the tongue from the buckle when the latch member is moved to the release position, said ejector member having means thereon adapted to engage a region of the latch member located to the rear of the pivotal axis of the latch member, having regard to the direction of insertion of the tongue into the buckle, so that when the tongue is inserted into the buckle rearward movement of the ejector causes the latch member to be moved to the latching position.

10. A buckle according to claim 2 or any claim dependent thereon wherein the secondary locking member comprises a member having two substantially perpendicular arms mounted to execute a pivotal movement about a pivotal axis, a first of said arms extending substantially perpendicularly to the plane defined by the base of the channel, the spring biasing the said ejector being connected to the said first arm, the other arm of the secondary locking member being substantially parallel with the plane of the base of the channel and defining said parts of the secondary locking member and being adapted to rest on upwardly directed faces formed on and upwardly extending portion of the latch member when the latch member is in a release position.

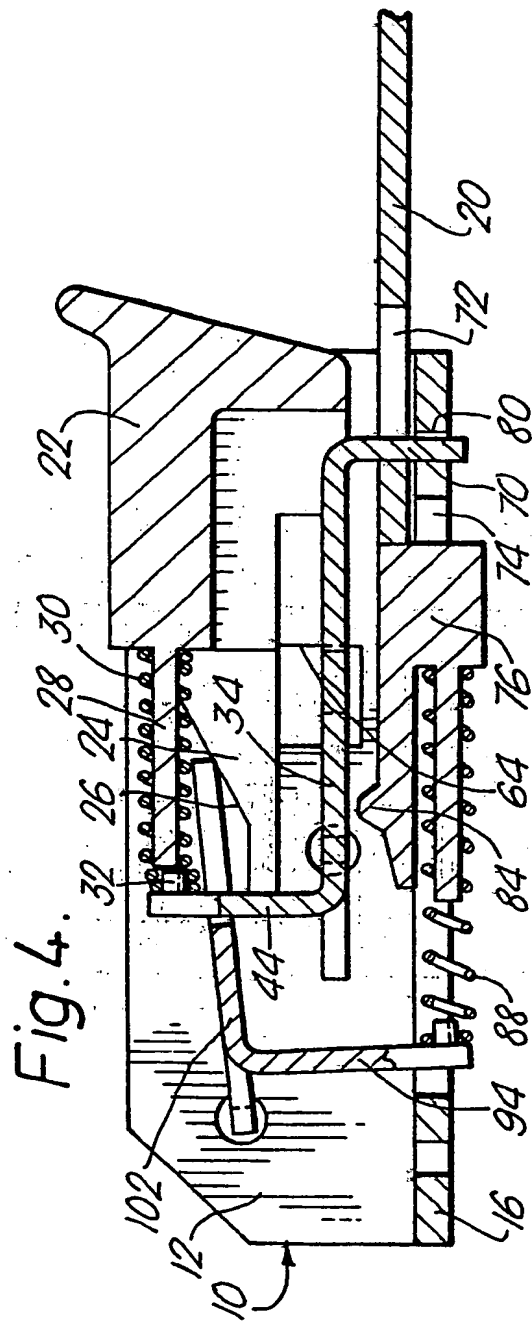
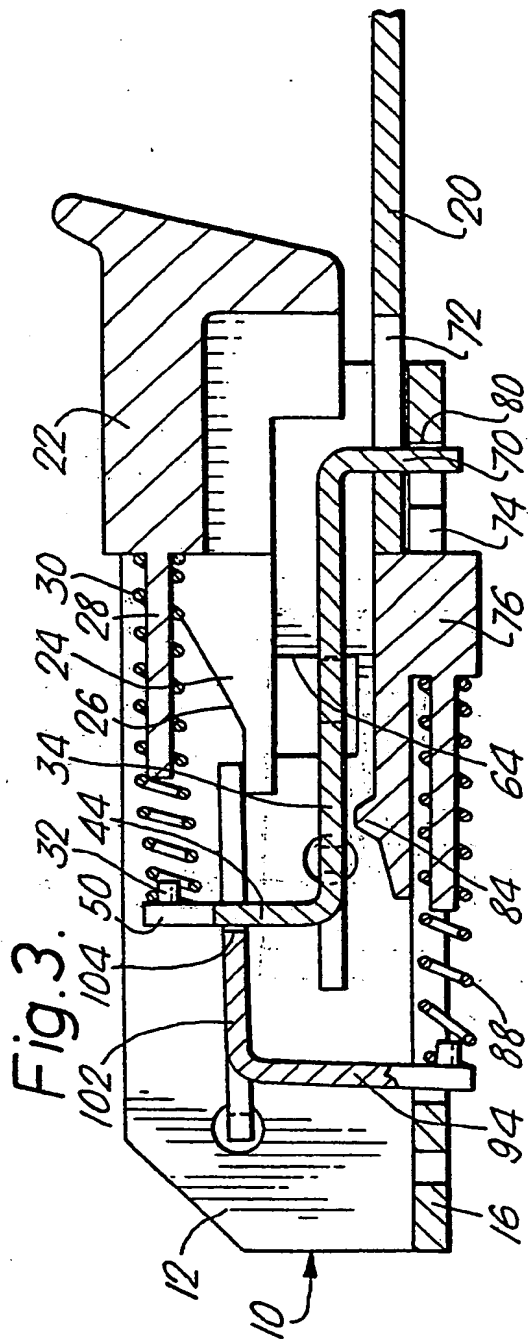
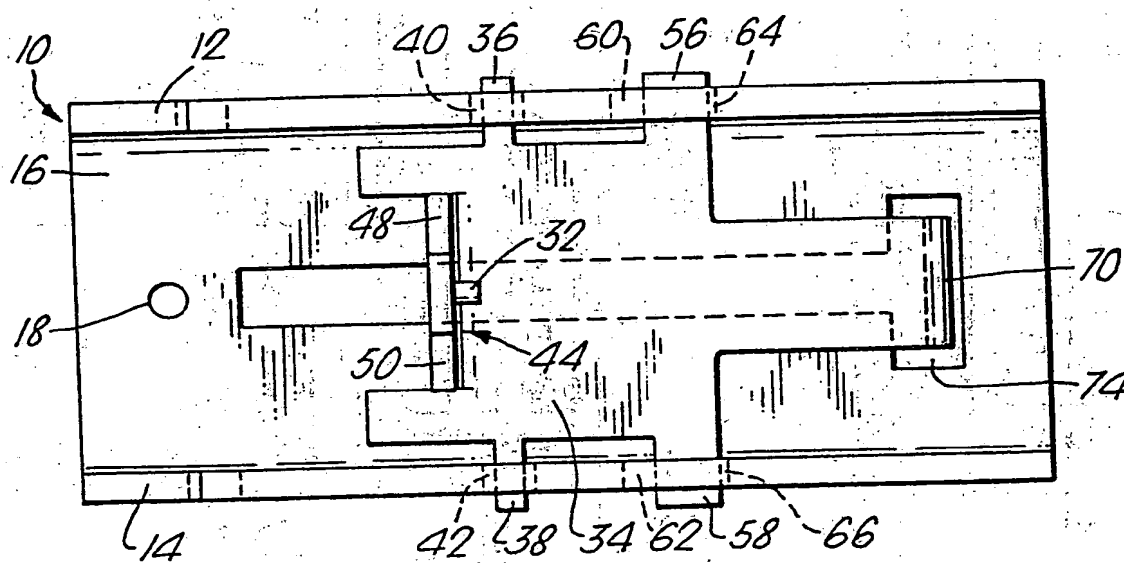


Fig. 5.



(19)



Europäisches Patentamt

European Patent Office

Office européen des brevets

(11) Publication number:

0 114 332

A3

(12)

EUROPEAN PATENT APPLICATION

(21) Application number: 83112755.0

(51) Int. Cl.⁴: A 44 B 11/25

(22) Date of filing: 19.12.83

(30) Priority: 23.12.82 SE 8207395

(43) Date of publication of application:
01.08.84 Bulletin 84/31

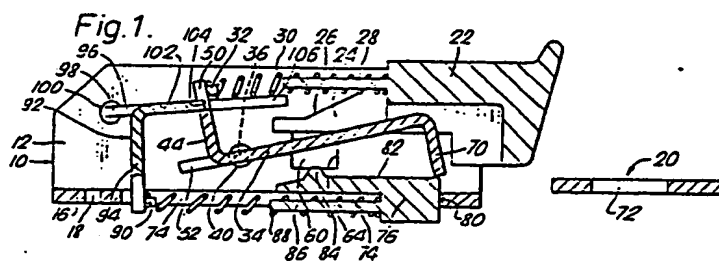
(88) Date of deferred publication of search report: 19.06.85

(84) Designated Contracting States:
DE FR GB IT(71) Applicant: AUTOLIV AB
P.O. Box 124
S-44700 Vargarda(SE)(72) Inventor: Emanuelson, Bjorn
Naektergalsgatan 7
S-447 00 Vaargaarda(SE)(72) Inventor: Wallin, Jan-Olof
Klockaregaardsvaegen 3
S-441 35 Alingsaas(SE)(74) Representative: Frankland, Nigel Howard et al,
FORRESTER & BOEHMERT Widenmayerstrasse 4/
D-8000 München 22(DE)

(54) A buckle.

(57) A buckle adapted to engage and retain a tongue part (20) attached to the strap portion of the vehicle safety belt when the tongue is inserted into the buckle along a predetermined path extending towards the rear of the buckle, said buckle comprising a main support member (10); a latch member (34) mounted on said support member (10) and movable between a "release" position and a "latching" position, the latch member having a portion (70) adapted to engage an abutment face defined on said tongue (20) when in said latching position; a secondary locking member (92) dimensioned and located to be moved, when the latch member (34) is in the latching position to a position in which the secondary locking member (92) engages part of the latch member (34), thus preventing the latch member (34) from

being inadvertently moved to the release position; and actuator means (22) operable to move the secondary locking member (92) to a position in which the latch member (34) may move to the release position and for moving the latch (34) to the release position to permit the tongue (20) to be released from the buckle: the latch member (34) having means adapted to engage the support member (10) if and when a substantial force is applied to the tongue (20) tending to withdrawn the tongue from the buckle while the latch (34) is in the latching position so that the force applied to the latch member (34) by the tongue is transferred directly to the support member (10).





European Patent
Office

EUROPEAN SEARCH REPORT

0114332

Application number

EP 83 11 2755

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 3)
X	EP-A-0 040 143 (PEUGEOT) * Page 2, line 35 - page 7, line 28; figures *	1, 3, 4, 6	A 44 B 11/25
A	---	2, 7-9	
X	FR-A-2 379 995 (PEUGEOT) * Page 2, line 26 - page 4, line 28; page 5, line 17 - page 6, line 10; figures *	1, 3, 4, 6	
A	---	2, 7-9	
X	WO-A-81 03 603 (STIL-INDUSTRI) * Page 2, line 6 - page 6, line 9; page 7, line 34 - page 8, line 18; figures *	1, 4, 6	TECHNICAL FIELDS SEARCHED (Int. Cl. 3)
A	---	10	A 44 B
X	DE-A-2 807 575 (STAHL GmbH) * Page 11; page 12, paragraph 1; page 13, line 24 - page 14, line 5; figures *	1, 4, 6	

	-/-		
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 01-03-1985	Examiner Mlle. BOURSEAU A.M.
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

EPO Form 1503 01/82

EUROPEAN SEARCH REPORT

Application number
EP 83 11 2755
Page 2

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int. Cl.)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
X	GB-A-2 071 753 (LINDBLAD) * Page 1, line 77 - page 3, line 3; page 4, lines 36-56; figures *	1	
P,X	EP-A-0 071 013 (N.V.KLIPPAN) * Page 3, line 22 - page 6, line 2; page 8, lines 10-36; figures *	1,3-6	
A		2,7-10	TECHNICAL FIELDS SEARCHED (Int. Cl.)

THIS PAGE BLANK (USPTO)